

Apple /// Plus

Addendum
to the
Standard Device
Drivers Manual



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Preface

Preface

Since the publication of the *Apple III Standard Device Drivers Manual*, both the Apple III and its drivers have been revised. The *Apple III Plus Owner's Guide* describes the new hardware. This addendum covers the software. It completes the description of the System Configuration Program given in the *Owner's Guide*. It also describes the software on the SYSTEM UTILITIES DATA disk: the revised drivers, the new keyboard layouts, and the character sets.

The contents of this addendum will be incorporated into the Apple III Plus revision of the *Standard Device Drivers Manual*. The new manual will be sent free to all Apple III Plus owners who have returned their warranty cards.

All the software described in this manual runs on the Apple III and the Apple III Plus, and it will improve the performance and functionality of both machines. Both the software and the manual will be available to Apple III owners who wish to upgrade their systems.

In addition to the drivers covered in this manual, other drivers have been revised. Consult your dealer for details.

Text for Standard Apple Symbols

Throughout this manual, you'll see the symbols explained below. Pay particular attention to the information contained in the paragraphs after these symbols.



This symbol precedes a paragraph that contains especially useful information.



Watch out! This symbol precedes a paragraph that warns you to be careful.



Stop! This symbol precedes a paragraph warning you that you may be about to destroy data or harm hardware.

Addendum

Introduction to Device Drivers

Page 4

Add this section to the end of page 4:

The UTILITIES DATA Disk

In addition to the SYSTEM UTILITIES disk, you will be using the UTILITIES DATA disk. This disk contains all the standard device drivers, as well as the standard keyboard layouts and character sets. With this disk you can configure your Apple III for any combination of these devices you wish to use with a given program. You can choose from two American keyboard layouts and several foreign ones. You can also choose the character set that will be displayed on the screen.

Additional drivers—for such optional devices as the Silentype printer, the Universal Parallel Interface Card (for parallel printers), and the ProFile—are provided with their respective devices.

Several drivers not described in this manual appear on the UTILITIES DATA disk. These have been recently revised to improve performance. If you have older versions (with lower version numbers) that you got with the respective devices, replace them with the new ones. Future revisions will be issued through Apple dealers.

The System Configuration Program

Page 15

Add this to the bottom of page 15:

The driver writer assigns the device type and subtype. They cannot be changed by the user. Previous versions of the System Configuration Program (SCP) allowed the user to do this, but incorrect setting of these values caused problems, so this option was removed.

Page 22

Replace the fourth paragraph with this:

To load a character set, select the Standard Character Set option on the system parameter display. When the program asks for the name of the file that holds the character set, type the complete pathname of the file and press RETURN. For example, to load the standard character set, insert the UTILITIES DATA disk in the built-in drive and type

```
/utilities.data/character.sets/standard
```

or

```
.d1/character.sets/standard
```

Page 23

Replace the fourth paragraph with this:

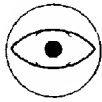
The keyboard layout table, like the standard character set, is loaded into the system configuration from a file. To load a keyboard layout, select the option on the system parameter display. The program will ask for the name of the file that holds the keyboard layout; type the complete pathname of the file and press RETURN. For example, to load the standard (Sholes) keyboard layout, insert the UTILITIES DATA disk in the built-in drive and type

```
/utilities.data/keyboard.layout/sholes
```

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Page 25

Replace the eye notice with this:



You may want to keep a disk with a collection of system configurations, under different names and with short descriptions of what they do. Then rather than creating entirely new configurations from scratch each time you change your system, you can load one of the prepared configurations and modify it to get the desired new configuration. One convenient way of creating these configurations is to make up a large configuration containing all the drivers you are likely to use: read each driver from the UTILITIES DATA disk, read the character set and keyboard layout you like, set up the other system parameters you want, and save that configuration on a disk with the Generate command. You can then make any smaller configuration from that one by simply deleting drivers.

On a 256K system, this would be the method of choice; on a 128K system with many devices, you might have to make several driver files from scratch.

In general, it is better to make up driver files yourself, rather than adding to the driver file that comes with a program. If you make the file yourself from the latest versions of each driver, you can easily be sure of your versions. On the other hand, if you add a ProFile driver, say, to an Apple Writer disk you have had for a while, some of the drivers on that disk may be earlier versions than those on your UTILITIES DATA disk. You can check versions by using the Edit Driver Parameters command, but this is more tedious than simply using versions known to be current.

Page 26

Add this section to the bottom of page 26:

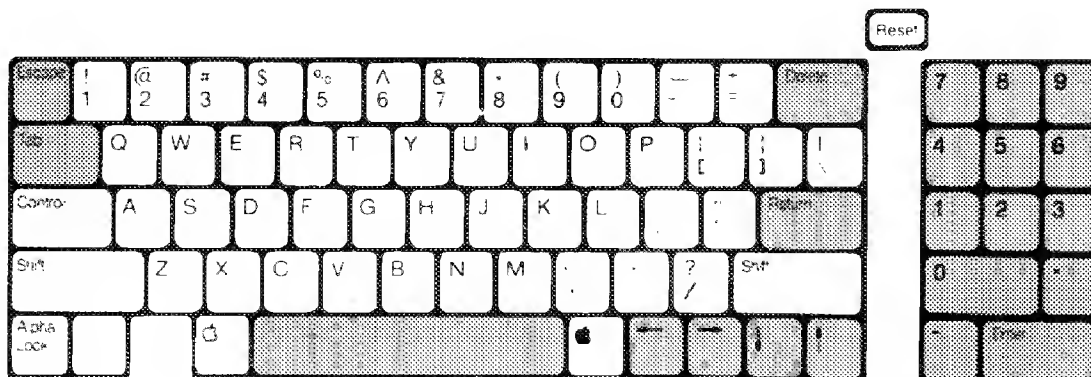
Getting the New Driver File Running

The Generate command simply builds a SOS.DRIVER file from a set of drivers and system parameters and writes that file onto a disk: it does not make that driver file active on your Apple III. To do that, you must put that SOS.DRIVER file onto a disk containing a SOS.KERNEL and a SOS.INTERP file, then insert that disk into the built-in drive and press CONTROL-RESET. When you execute the SCP, you are building a driver file in memory, but in a different region from that used by SOS to store its active drivers. When you write that driver file onto a disk, then restart SOS from that disk, the new driver files are attached to SOS so that they can be used.

The Console Driver

Page 48

Replace the keyboard diagram and the first paragraph with this:



Standard: ☐ Special: ☒ Modifier: ☐

The special keys are ESCAPE, DELETE, TAB, RETURN, the SPACE bar, the four arrow keys on the main keyboard, and all keys on the

4 Addendum to the Standard Device Drivers Manual

numeric keypad. The special keys always generate the same ASCII codes, regardless of the condition of the SHIFT and CONTROL keys. The keyboard layout table does not define codes for these keys.

Page 50

Add this eye notice before the last paragraph:



The DELETE key has no special significance to the console driver: it merely generates the DEL character (ASCII \$7F, or 127). This key and its character code can be used by an application program for any function, including deleting characters, but it need not be used for anything.

The DEL character can also be generated by one of the standard keys, with the SHIFT and CONTROL keys in the correct positions. This allows the Apple III to use programs written for the Apple III Plus. See Appendix A for details.

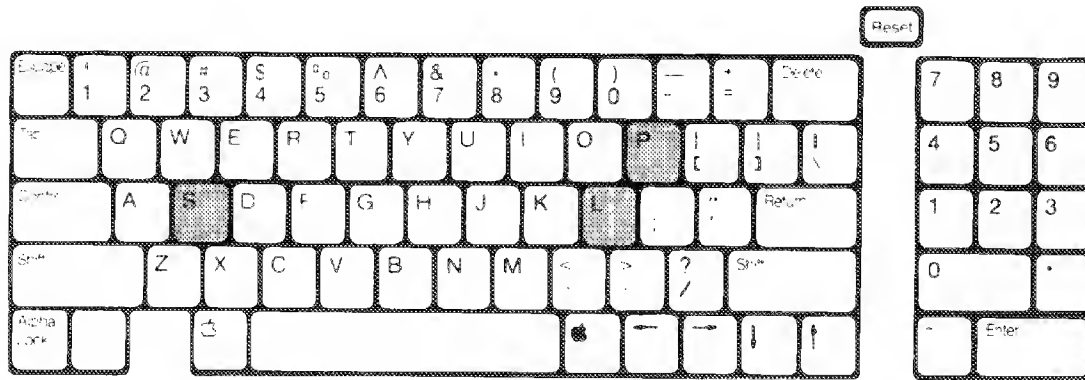
Page 53

Replace the keyboard diagram with this:



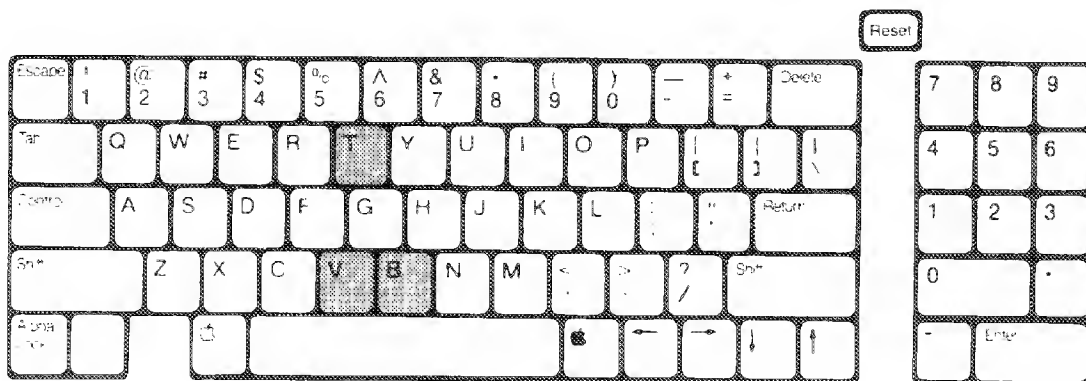
Page 54

Replace the keyboard diagram with this:



Page 55

Replace the keyboard diagram with this:



Page 57

Replace the third paragraph with this:

Toggle Video Output (CONTROL-5 on the numeric keypad) turns the video output on and off. You can still write data to the console when the video output is off, but it will not be visible until the video is turned on. Video is turned on automatically if a program requests keyboard input when the type-ahead buffer is empty; an I/O reset from a program also automatically turns the video on. The Apple III runs programs about 20 percent faster with the video turned off than it does with video on. Thus, you can manually speed up portions of your programs that do not require video output by using this control.

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Page 58

Replace the eye notice with this:



Screen control codes will have no effect after you press CONTROL-8. This includes the screen characters issued by the cursor command mode: in other words, ESCAPE mode isn't useful when CONTROL-8 is in effect.

Similarly, status code 18 and control code 18 (preserve and restore contents of viewport) will have no effect if CONTROL-8 is in effect.

Page 63

Add this information to page 63:

Status code: 9 (Read Screen)
Status list: Character byte

Returns the ASCII value of the character at the current cursor position. Does not affect the screen or change the cursor position. If the character is displayed in inverse video, the high bit will be set. If the character is displayed in normal video, the high bit will be clear. (See also status code 17, which follows.)

Page 65

Replace the sections on status codes 17 and 18 with this:

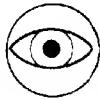
Status code: 17 (Read Text Screen)
Status list: Character byte

Returns the ASCII value of the character at the current cursor position. Does not affect the screen or change the cursor position. If the character is a control character (ASCII \$00 to \$1F), the high bit will be set, giving a value from \$80 to \$9F. If the character is a printing character (ASCII \$20 to \$7F), the high bit will be clear. (See also status code 9.)

Status code: 18 (Preserve Contents of Viewport)

Status list: Viewport data

The contents of the viewport (both text and color information) are copied to the status list. The status list must be large enough to hold all of the data. In the 80-column display modes, the amount of storage space required for the viewport data is equal to the width of the viewport multiplied by the height, plus 3. In the 40-column modes, the space required is equal to twice the width of the viewport times the height, plus 3.

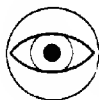


Status code 18 is commonly used with control code 18 for displaying temporary messages, like help messages, on a small part of the screen. To display a message, you set up a viewport for the message, preserve the contents of the viewport in a buffer, then print the message. To remove the message, you restore the contents of the viewport, then reset the viewport.

In CONTROL-8 mode, you can't set the viewport, so the console could attempt to preserve the contents of a large viewport in a small buffer, causing other data to be overwritten. To prevent this, the console does not preserve the contents of the viewport when it is in CONTROL-8 mode. Instead, a special value is stored in the first three bytes of the buffer so that control code 18 will not restore invalid data.

Page 71

Add this eye notice after the section on control code 18:



Control code 18 will not restore the contents of the viewport if CONTROL-8 mode is in effect or if CONTROL-8 mode was in effect when the contents of the viewport were preserved.

The Graphics Driver

Page 74

Add this eye notice after the second paragraph:



When using the graphics driver, turn text interlace off.

Page 86

Add this eye notice after the first paragraph:



When using the graphics driver, turn text interlace off.

Reading the Screen

Page 94

Replace the two paragraphs at the bottom of page 94 with this:

Performing a BASIC INPUT# statement or a Pascal READ statement from the file .GRAFIX will return a single character. The value of the character returned represents the screen color of the current pen position. Returned values will be alphabetic characters with values from 64 to 79; the true color value can be obtained by subtracting 64 from the value of the character returned. If the graphics mode is black and white, the values 64 (for black) or 79 (for white) are returned.

A color value is returned regardless of whether the pen is in the viewport. If, however, the pen position is not inside the boundaries of the current graphics screen, a character with the value of 128 will be returned.

The Printer Driver

Page 99

Replace the introductory paragraphs with this:

The standard device driver .PRINTER (stored in the file .SERPRINT on the UTILITIES DATA disk) enables your programs to send output to a serial printer, such as the Apple Daisy Wheel Printer. The .PRINTER driver is an output-only driver using the Apple III's built-in RS-232-C serial interface: it will not allow you to read information through the RS-232-C port. For that, you must use the driver .RS232, which is described in Chapter 6.

The printer driver is configured to drive the Apple Daisy Wheel Printer. To use another serial printer, you should first examine the configuration values given below. If changes are necessary, use the System Configuration Program to change the printer driver's configuration block. An explanation of this procedure appears in the section "Changing the Configuration Block" later in this chapter.

Page 101

Replace the second paragraph with this:

If the printer is connected to the Apple III through a modem eliminator (see the section "Connecting the Printer"), it should provide its handshake signals on Data Terminal Ready (pin 20), Request To Send (pin 4), or both. If you are using an Apple Daisy Wheel Printer, switch 1 should be set to 11100100. See the *Daisy Wheel Printer Manual*, Part II, for details on switch settings.

Changing the Configuration Block

Page 101

Replace the paragraph that begins on the bottom of page 101 with this:

The printer driver's configuration block contains five parameters that control the way it communicates with a printer. The first two parameters control the data rate and the format of the output data sent to the printer. The last three parameters control the amount of time the printer driver waits after it sends a line feed, carriage return, or form feed character. These parameters are normally set to default values appropriate for an Apple Daisy Wheel Printer at 1200 baud.

Page 104

Replace the second paragraph with this:

The normal value of byte number 2 for the Apple Daisy Wheel Printer is 22: seven data bits transmitted per character, with odd parity.

Page 105

Replace the third paragraph with this:

To connect a modem to your Apple III, you simply plug its 25-pin connector into the RS-232 port, but to connect a serial printer, you must use a modem eliminator. The modem eliminator is a short cable with a 25-pin connector on each end. This cable redirects several signals to different pins in the same way as a modem does. (A diagram of the modem eliminator is in Appendix C). The modem eliminator is available through your Apple dealer by ordering product number A3M0019.

Console Quick Reference

Appendix A

Replace pages 135-140 of Appendix A with the following material:

Keyboard Codes

This section describes three keyboards: the original Apple III keyboard, the North American (ANSI) Apple III Plus keyboard, and the Standard International (ISO) Apple III Plus keyboard. These keyboards all produce the same characters, although some keys are in different places, and the two Apple III Plus keyboards have a separate DELETE key.

In the diagrams below, standard keys are white, special keys are heavily shaded, and modifier keys are lightly shaded.

Original Apple III Keyboard



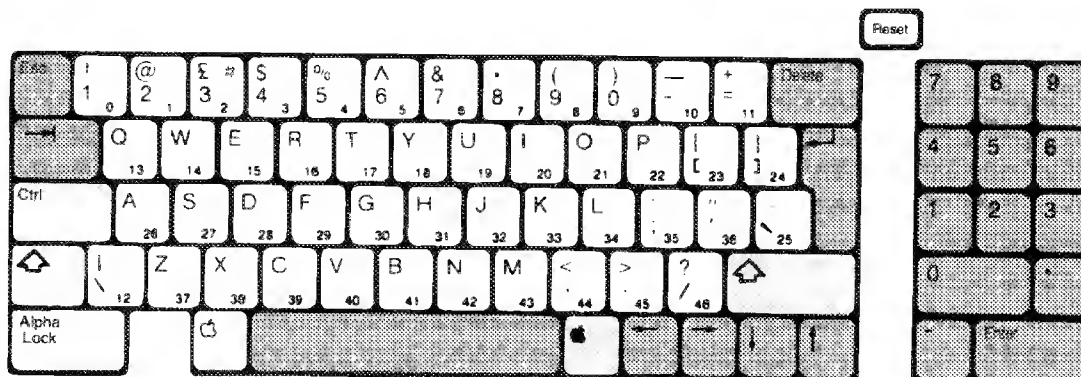
Standard:  Special:  Modifier: 

North American Apple III Plus Keyboard



Standard: Special: Modifier:

ISO Standard International Apple III Plus Keyboard

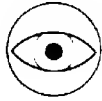


Standard: Special: Modifier:

Standard Keys

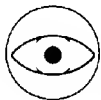
Standard keys are defined by the keyboard layout in the SOS.DRIVER file. Each standard key can produce up to four codes, depending on the positions of the SHIFT and CONTROL keys. Standard keys are white in the diagrams above, and each of these keys is numbered: these numbers are the index numbers for the keyboard layout. For the original Apple III keyboard, the numbers run left to right, top to bottom. For the new keyboards, some of the keys are in a different order, so that the same keyboard layouts can be used with all three keyboards.

This allows the same software to be used on any of the keyboards, without reconfiguring the SOS.DRIVER file. Naturally, if a program uses the DEL character for a special function, the new keyboards, with the DELETE key, will be more convenient. The original Apple III keyboard can generate the DEL character, but only with compound keystrokes.



With some keyboard layouts, the same key can produce both the DEL and FS characters, depending on the state of the SHIFT key. Since Pascal interprets the FS character as a "program halt" command, a software developer might wish to provide an alternate keystroke with the same function as the DEL character. ␣ - ← and CONTROL- ← have both been used for deletion, for example. This would provide greater convenience to Apple III Plus users, as well as safety to Apple III users.

Apple's standard keyboard layouts follow. For each key, you have its keyboard layout number, its label, and the ASCII codes produced by the key in all four positions of the SHIFT and CONTROL keys: normal (both up), SHIFT down, CONTROL down, and both SHIFT and CONTROL down. All layout numbers are decimal; ASCII codes are hexadecimal. In the **Normal** column, some characters will be followed by an asterisk: this indicates that in this keyboard layout, this key is affected by ALPHA LOCK. For such keys, the **Normal** entry in the keyboard layout has its high bit set: the number is \$80 or greater. The actual ASCII code will have the high bit clear. For example, consider key \$13 (Q) in the Shoes table that follows. The **Normal** entry is \$F1. The actual character code produced by pressing key \$13 alone is \$F1 - \$80, or \$71, which is q.



These keyboard layouts are used only in Apple III Plus native mode. Emulation mode uses a fixed layout that cannot be changed by the user.

Keyboard Layout Table: Sholes

Key	Label	Normal	SHIFT	CONTROL	Both
0	1 !	31 1	21 !	31 1	21 !
1	2 @	32 2	40 @	00 NUL	00 NUL
2	3 #	33 3	23 #	33 3	23 #
3	4 \$	34 4	24 \$	34 4	24 \$
4	5 %	35 5	25 %	35 5	25 %
5	6 ^	36 6	5E ^	1E RS	1E RS
6	7 &	37 7	26 &	37 7	26 &
7	8 *	38 8	2A *	38 8	2A *
8	9 (	39 9	28 (	39 9	28 (
9	0)	30 0	29)	30 0	29)
10	- _	2D -	5F _	1F US	1F US
11	= +	3D =	2B +	3D =	2B +
12	\ |	5C \	7C |	1C FS	7F DEL
13	Q	F1 q*	51 Q	11 DC1	11 DC1
14	W	F7 w*	57 W	17 ETB	17 ETB
15	E	E5 e*	45 E	05 ENQ	05 ENQ
16	R	F2 r*	52 R	12 DC2	12 DC2
17	T	F4 t*	54 T	14 DC4	14 DC4
18	Y	F9 y*	59 Y	19 EM	19 EM
19	U	F5 u*	55 U	15 NAK	15 NAK
20	I	E9 i*	49 I	09 HT	09 HT
21	O	EF o*	4F O	0F SI	0F SI
22	P	F0 p*	50 P	10 DLE	10 DLE
23	[{	5B [	7B {	1B ESC	1B ESC
24	] }	5D]	7D }	1D GS	1D GS
25	~ `	60 ~	7E `	60 ~	7E `
26	A	E1 a*	41 A	01 SOH	01 SOH
27	S	F3 s*	53 S	13 DC3	13 DC3
28	D	E4 d*	44 D	04 EOT	04 EOT
29	F	E6 f*	46 F	06 ACK	06 ACK
30	G	E7 g*	47 G	07 BEL	07 BEL
31	H	E8 h*	48 H	08 BS	08 BS
32	J	EA j*	4A J	0A LF	0A LF
33	K	EB k*	4B K	0B VT	0B VT
34	L	EC l*	4C L	0C FF	0C FF
35	; :	3B ;	3A :	3B ;	3A :
36	' "	27 '	22 "	27 '	22 "
37	Z	FA z*	5A Z	1A SUB	1A SUB
38	X	F8 x*	58 X	18 CAN	18 CAN
39	C	E3 c*	43 C	03 ETX	03 ETX
40	V	F6 v*	56 V	16 SYN	16 SYN
41	B	E2 b*	42 B	02 STX	02 STX
42	N	EE n*	4E N	0E SO	0E SO
43	M	ED m*	4D M	0D CR	0D CR
44	, <	2C ,	3C <	2C ,	3C <
45	. >	2E .	3E >	2E .	3E >
46	/ ?	2F /	3F ?	2F /	3F ?

Keyboard Layout Table: Dvorak

Key	Label	Normal	SHIFT	CONTROL	Both
0	1 !	31 1	21 !	31 1	21 !
1	2 @	32 2	40 @	00 NUL	00 NUL
2	3 #	33 3	23 #	33 3	23 #
3	4 \$	34 4	24 \$	34 4	24 \$
4	5 %	35 5	25 %	35 5	25 %
5	6 ^	36 6	5E ^	1E RS	1E RS
6	7 &	37 7	26 &	37 7	26 &
7	8 *	38 8	2A *	38 8	2A *
8	9 (	39 9	28 (	39 9	28 (
9	0)	30 0	29)	30 0	29)
10	[{	5B [	7B {	1B ESC	1B ESC
11	] }	5D]	5D }	1D GS	1D GS
12	\ |	5C \	7C |	1C FS	7F DEL
13	' "	27 ' "	22 "	27 ' "	22 "
14	, <	2C ,	3C <	2C ,	3C <
15	. >	2E .	3E >	2E .	3E >
16	P	F0 p*	50 P	10 DLE	10 DLE
17	Y	F9 y*	59 Y	19 EM	19 EM
18	F	E6 f*	46 F	06 ACK	06 ACK
19	G	E7 g*	47 G	07 BEL	07 BEL
20	C	E3 c*	43 C	03 ETX	03 ETX
21	R	F2 r*	52 R	12 DC2	12 DC2
22	L	EC l*	4C L	0C FF	0C FF
23	/ ?	2F /	3F ?	2F /	3F ?
24	= +	3D =	2B +	3D =	2B +
25	~ `	60 ~	7E `	60 ~	7E `
26	A	E1 a*	41 A	01 SOH	01 SOH
27	O	EF o*	4F O	0F SI	0F SI
28	E	E5 e*	45 E	05 ENQ	05 ENQ
29	U	F5 u*	55 U	15 NAK	15 NAK
30	I	E9 i*	49 I	09 HT	09 HT
31	D	E4 d*	44 D	04 EOT	04 EOT
32	H	E8 h*	48 H	08 BS	08 BS
33	T	F4 t*	54 T	14 DC4	14 DC4
34	N	EE n*	4E N	0E SO	0E SO
35	S	F3 s*	53 S	13 DC3	13 DC3
36	- _	2D -	5F _	1F US	1F US
37	; :	3B ;	3A :	3B ;	3A :
38	Q	F1 q*	51 Q	11 DC1	11 DC1
39	J	EA j*	4A J	0A LF	0A LF
40	K	EB k*	4B K	0B VT	0B VT
41	X	F8 x*	58 X	18 CAN	18 CAN
42	B	E2 b*	42 B	02 STX	02 STX
43	M	ED m*	4D M	0D CR	0D CR
44	W	F7 w*	57 W	17 ETB	17 ETB
45	V	F6 v*	56 V	16 SYN	16 SYN
46	Z	FA z*	5A Z	1A SUB	1A SUB

Keyboard Layout Table: British

Key	Label	Normal	SHIFT	CONTROL	Both
0	1 !	31 1	21 !	31 1	21 !
1	2 @	32 2	40 @	00 NUL	00 NUL
2	3 £	33 3	23 £	33 3	23 £
3	4 \$	34 4	24 \$	34 4	24 \$
4	5 %	35 5	25 %	35 5	25 %
5	6 ^	36 6	5E ^	1E RS	1E RS
6	7 &	37 7	26 &	37 7	26 &
7	8 *	38 8	2A *	38 8	2A *
8	9 (	39 9	28 (	39 9	28 (
9	0)	30 0	29)	30 0	29)
10	- _	2D -	5F _	1F US	1F US
11	= +	3D =	2B +	3D =	2B +
12	\ |	5C \	7C |	1C FS	7F DEL
13	Q	F1 q*	51 Q	11 DC1	11 DC1
14	W	F7 w*	57 W	17 ETB	17 ETB
15	E	E5 e*	45 E	05 ENQ	05 ENQ
16	R	F2 r*	52 R	12 DC2	12 DC2
17	T	F4 t*	54 T	14 DC4	14 DC4
18	Y	F9 y*	59 Y	19 EM	19 EM
19	U	F5 u*	55 U	15 NAK	15 NAK
20	I	E9 i*	49 I	09 HT	09 HT
21	O	EF o*	4F O	0F SI	0F SI
22	P	F0 p*	50 P	10 DLE	10 DLE
23	[{	5B {	7B {	1B ESC	1B ESC
24	] }	5D }	7D }	1D GS	1D GS
25	` ~	60 `	7E ~	60 `	7E ~
26	A	E1 a*	41 A	01 SOH	01 SOH
27	S	F3 s*	53 S	13 DC3	13 DC3
28	D	E4 d*	44 D	04 EOT	04 EOT
29	F	E6 f*	46 F	06 ACK	06 ACK
30	G	E7 g*	47 G	07 BEL	07 BEL
31	H	E8 h*	48 H	08 BS	08 BS
32	J	EA j*	4A J	0A LF	0A LF
33	K	EB k*	4B K	0B VT	0B VT
34	L	EC l*	4C L	0C FF	0C FF
35	; :	3B ;	3A :	3B ;	3A :
36	' "	27 '	22 "	27 '	22 "
37	Z	FA z*	5A Z	1A SUB	1A SUB
38	X	F8 x*	58 X	18 CAN	18 CAN
39	C	E3 c*	43 C	03 ETX	03 ETX
40	V	F6 v*	56 V	16 SYN	16 SYN
41	B	E2 b*	42 B	02 STX	02 STX
42	N	EE n*	4E N	0E SO	0E SO
43	M	ED m*	4D M	0D CR	0D CR
44	, <	2C ,	3C <	2C ,	3C <
45	. >	2E .	3E >	2E .	3E >
46	/ ?	2F /	3F ?	2F /	3F ?

(£ = British pound sign)

Keyboard Layout Table: French

Key	Label	Normal	SHIFT	CONTROL	Both
0	& 1	26 &	31 1	26 &	31 1
1	é 2	7B é	32 2	7B é	32 2 (é = e acute accent)
2	" 3	22 "	33 3	22 "	33 3
3	' 4	27 '	34 4	27 '	34 4
4	(5	28 (	35 5	28 (	35 5
5	\$ 6	5D \$	36 6	1D GS	1D GS (\$ = section mark)
6	è 7	7D è	37 7	7D è	37 7 (è = e grave accent)
7	! 8	21 !	38 8	21 !	38 8
8	ç 9	5C ç	39 9	1C FS	1C FS (ç = c cedilla)
9	à 0	40 à	30 0	00 NUL	00 NUL (à = a grave accent)
10	) °	29)	5B °	1B ESC	1B ESC (° = degree)
11	-	2D -	5F -	1F US	1F US
12	< >	3C <	3E >	7F DEL	7F DEL
13	A	E1 a*	41 A	01 SOH	01 SOH
14	Z	FA z*	5A Z	1A SUB	1A SUB
15	E	E5 e*	45 E	05 ENQ	05 ENQ
16	R	F2 r*	52 R	12 DC2	12 DC2
17	T	F4 t*	54 T	14 DC4	14 DC4
18	Y	F9 y*	59 Y	19 EM	19 EM
19	U	F5 u*	55 U	15 NAK	15 NAK
20	I	E9 i*	49 I	09 HT	09 HT
21	O	EF o*	4F O	0F SI	0F SI
22	P	FO p*	50 P	10 DLE	10 DLE
23	^ "	5E ^	7E "	1E RS	1E RS (" = diaeresis)
24	\$ *	24 \$	2A *	24 \$	2A *
25	~ £	60 ~	23 £	60 ~	23 £ (£ = British pound sign)
26	Q	F1 q*	51 Q	11 DC1	11 DC1
27	S	F3 s*	53 S	13 DC3	13 DC3
28	D	E4 d*	44 D	04 EOT	04 EOT
29	F	E6 f*	46 F	06 ACK	06 ACK
30	G	E7 g*	47 G	07 BEL	07 BEL
31	H	E8 h*	48 H	08 BS	08 BS
32	J	EA j*	4A J	0A LF	0A LF
33	K	EB k*	4B K	0B VT	0B VT
34	L	EC l*	4C L	0C FF	0C FF
35	M	ED m*	4D M	0D CR	0D CR
36	û %	7C û	25 %	7C û	25 % (û = u grave accent)
37	W	F7 w*	57 W	17 ETB	17 ETB
38	X	F8 x*	58 X	18 CAN	18 CAN
39	C	E3 c*	43 C	03 ETX	03 ETX
40	V	F6 v*	56 V	16 SYN	16 SYN
41	B	E2 b*	42 B	02 STX	02 STX
42	N	EE n*	4E N	0E SO	0E SO
43	, ?	2C ,	3F ?	2C ,	3F ?
44	; .	3B ;	2E .	3B ;	2E .
45	: /	3A :	2F /	3A :	2F /
46	= +	3D =	2B +	3D =	2B +

Keyboard Layout Table: French Canadian

Key	Label	Normal	SHIFT	CONTROL	Both
0	1 !	31 I	21 !	31 I	21 !
1	2 à	32 2	40 à	00 NUL	00 NUL (à = a grave accent)
2	3 £	33 3	23 £	33 3	23 £ (£ = British pound sign)
3	4 \$	34 4	24 \$	34 4	24 \$
4	5 %	35 5	25 %	35 5	25 %
5	6 ^	36 6	5E ^	1E RS	1E RS
6	7 &	37 7	26 &	37 7	26 &
7	8 *	38 8	2A *	38 8	2A *
8	9 (	39 9	28 (	39 9	28 (
9	0)	30 0	29)	30 0	29)
10	- _	2D -	5F _	1F US	1F US
11	= +	3D =	2B +	3D =	2B +
12	° §	5B °	5D §	1B ESC	1D GS (° = degree; § = section)
13	Q	F1 q*	51 Q	11 DC1	11 DC1
14	W	F7 w*	57 W	17 ETB	17 ETB
15	E	E5 e*	45 E	05 ENQ	05 ENQ
16	R	F2 r*	52 R	12 DC2	12 DC2
17	T	F4 t*	54 T	14 DC4	14 DC4
18	Y	F9 y*	59 Y	19 EM	19 EM
19	U	F5 u*	55 U	15 NAK	15 NAK
20	I	E9 i*	49 I	09 HT	09 HT
21	O	EF o*	4F O	0F SI	0F SI
22	P	F0 p*	50 P	10 DLE	10 DLE
23	è û	7D è	7C û	7F DEL	7F DEL (è = e grave; û = u grave)
24	/ ?	2F /	3F ?	2F /	3F ?
25	` "	60 `	7E "	60 `	7E " (" = diaeresis)
26	A	E1 a*	41 A	01 SOH	01 SOH
27	S	F3 s*	53 S	13 DC3	13 DC3
28	D	E4 d*	44 D	04 EOT	04 EOT
29	F	E6 f*	46 F	06 ACK	06 ACK
30	G	E7 g*	47 G	07 BEL	07 BEL
31	H	E8 h*	48 H	08 BS	08 BS
32	J	EA j*	4A J	0A LF	0A LF
33	K	EB k*	4B K	0B VT	0B VT
34	L	EC l*	4C L	0C FF	0C FF
35	; :	3B ;	3A :	3B ;	3A :
36	' "	27 '	22 "	27 ' 22 "	
37	Z	FA z*	5A Z	1A SUB	1A SUB
38	X	F8 x*	58 X	18 CAN	18 CAN
39	C	E3 c*	43 C	03 ETX	03 ETX
40	V	F6 v*	56 V	16 SYN	16 SYN
41	B	E2 b*	42 B	02 STX	02 STX
42	N	EE n*	4E N	0E SO	0E SO
43	M	ED m*	4D M	0D CR	0D CR
44	, <	2C ,	3C <	2C ,	3C <
45	. >	2E .	3E >	2E .	3E >
46	é ç	7B é	5C ç	1C FS	1C FS (é = e acute; ç = c cedilla)

Keyboard Layout Table: German

Key	Label	Normal	SHIFT	CONTROL	Both
0	1 !	31 1	21 !	31 1	21 !
1	2 "	32 2	22 "	32 2	22 "
2	3 \$	33 3	40 \$	00 NUL	00 NUL (\$ = section mark)
3	4 %	34 4	24 %	34 4	24 %
4	5 &	35 5	25 %	35 5	25 %
5	6 &	36 6	26 &	36 6	26 &
6	7 /	37 7	2F /	37 7	26 /
7	8 (	38 8	28 (	38 8	28 (
8	9)	39 9	29)	39 9	29)
9	0 =	30 0	3D =	30 0	3D =
10	ß ?	7E ß	3F ?	7E ß	3F ? (ß = double s)
11	' ^	27 ' 60 ^	27 ' 60 ^		
12	< >	3C < 3E >	7F DEL 7F DEL		
13	Q	F1 q* 51 Q	11 DC1 11 DC1		
14	W	F7 w* 57 W	17 ETB 17 ETB		
15	E	E5 e* 45 E	05 ENQ 05 ENQ		
16	R	F2 r* 52 R	12 DC2 12 DC2		
17	T	F4 t* 54 T	14 DC4 14 DC4		
18	Z	FA z* 5A Z	1A SUB 1A SUB		
19	U	F5 u* 55 U	15 NAK 15 NAK		
20	I	E9 i* 49 I	09 HT 09 HT		
21	O	EF o* 4F O	0F SI 0F SI		
22	P	F0 p* 50 P	10 DLE 10 DLE		
23	Ü	FD ü* 5D Ü	1D GS 1D GS		(U umlaut: ü = LC; Ü = UC)
24	+ *	2B + 2A *	2B + 2A *		
25	# ^	23 # 5E ^	1E RS 1E RS		
26	A	E1 a* 41 A	01 SOH 01 SOH		
27	S	F3 s* 53 S	13 DC3 13 DC3		
28	D	E4 d* 44 D	04 EOT 04 EOT		
29	F	E6 f* 46 F	06 ACK 06 ACK		
30	G	E7 g* 47 G	07 BEL 07 BEL		
31	H	E8 h* 48 H	08 BS 08 BS		
32	J	EA j* 4A J	0A LF 0A LF		
33	K	EB k* 4B K	0B VT 0B VT		
34	L	EC l* 4C L	0C FF 0C FF		
35	Ö	FC ö* 5C Ö	1C FS 1C FS		(O umlaut: ö = LC; Ö = UC)
36	Ä	FB ä* 5B Ä	1B ESC 1B ESC		(A umlaut: ä = LC; Ä = UC)
37	Y	F9 y* 59 Y	19 EM 19 EM		
38	X	F8 x* 58 X	18 CAN 18 CAN		
39	C	E3 c* 43 C	03 ETX 03 ETX		
40	V	F6 v* 56 V	16 SYN 16 SYN		
41	B	E2 b* 42 B	02 STX 02 STX		
42	N	EE n* 4E N	0E SO 0E SO		
43	M	ED m* 4D M	0D CR 0D CR		
44	, ;	2C , 3B ;	2C , 3B ;		
45	. :	2E . 3A :	2E . 3A :		
46	- _	2D - 5F _	1F US 1F US		

Keyboard Layout Table: Italian

Key	Label	Normal	SHIFT	CONTROL	Both	
0	& 1	26 &	31 1	26 &	31 1	
1	" 2	22 "	32 2	22 "	32 2	
2	' 3	27 '	33 3	27 '	33 3	
3	(4	28 (	34 4	28 (	34 4	
4	ç 5	5C ç	35 5	1C FS	1C FS	(ç = c cedilla)
5	è 6	7D è	36 6	7D è	36 6	(è = e grave accent)
6	) 7	29)	37 7	29)	37 7	
7	£ 8	23 £	38 8	23 £	38 8	(£ = British pound sign)
8	à 9	7B à	39 9	7B à	39 9	(à = a grave accent)
9	é 0	5D é	30 0	1D GS	1D GS	(é = e acute accent)
10	-	2D -	5F	1F US	1F US	
11	= +	3D =	2B +	3D =	2B +	
12	< >	3C <	3E >	7F DEL	7F DEL	
13	Q	F1 q*	51 Q	11 DC1	11 DC1	
14	Z	FA z*	5A Z	1A SUB	1A SUB	
15	E	E5 e*	45 E	05 ENQ	05 ENQ	
16	R	F2 r*	52 R	12 DC2	12 DC2	
17	T	F4 t*	54 T	14 DC4	14 DC4	
18	Y	F9 y*	59 Y	19 EM	19 EM	
19	U	F5 u*	55 U	15 NAK	15 NAK	
20	I	E9 i*	49 I	09 HT	09 HT	
21	O	EF o*	4F O	0F SI	0F SI	
22	P	FO p*	50 P	10 DLE	10 DLE	
23	ì ^	7E ì	5E ^	1E RS	1E RS	(ì = i grave accent)
24	\$ *	24 \$	2A *	24 \$	2A *	
25	\$ °	40 \$	5B °	00 NUL	1B ESC	(\$ = section; ° = degree)
26	A	E1 a*	41 A	01 SOH	01 SOH	
27	S	F3 s*	53 S	13 DC3	13 DC3	
28	D	E4 d*	44 D	04 EOT	04 EOT	
29	F	E6 f*	46 F	06 ACK	06 ACK	
30	G	E7 g*	47 G	07 BEL	07 BEL	
31	H	E8 h*	48 H	08 BS	08 BS	
32	J	EA j*	4A J	0A LF	0A LF	
33	K	EB k*	4B K	0B VT	0B VT	
34	L	EC l*	4C L	0C FF	0C FF	
35	M	ED m*	4D M	0D CR	0D CR	
36	ù %	60 ù	25 %	60 ù	25 %	(ù = u grave accent)
37	W	F7 w*	57 W	17 ETB	17 ETB	
38	X	F8 x*	58 X	18 CAN	18 CAN	
39	C	E3 c*	43 C	03 ETX	03 ETX	
40	V	F6 v*	56 V	16 SYN	16 SYN	
41	B	E2 b*	42 B	02 STX	02 STX	
42	N	EE n*	4E N	0E SO	0E SO	
43	, ?	2C ,	3F ?	2C ,	3F ?	
44	; .	3B ;	2E .	3B ;	2E .	
45	: /	3A :	2F /	3A :	2F /	
46	ò !	7C ò	21 !	7C ò	21 !	(ò = o grave accent)

Keyboard Layout Table: Spanish

Key	Label	Normal	SHIFT	CONTROL	Both	
0	1 !	31 1	21 !	31 1	21 !	
1	2 "	32 2	22 "	32 2	22 "	
2	3 £	33 3	23 £	33 3	23 £	(£ = British pound sign)
3	4 \$	34 4	24 \$	34 4	24 \$	
4	5 %	35 5	25 %	35 5	25 %	
5	6 &	36 6	26 &	36 6	26 &	
6	7 /	37 7	2F /	37 7	2F /	
7	8 (	38 8	28 (	38 8	28 (
8	9)	39 9	29)	39 9	29)	
9	0 =	30 0	3D =	30 0	3D =	
10	' ?	27 '	3F ?	27 '	3F ?	
11	~ ¡	7E ~	5B ¡	1B ESC	1B ESC	(¡ = inverted !)
12	< >	3C <	3E >	7F DEL	7F DEL	
13	Q	F1 q*	51 Q	11 DC1	11 DC1	
14	W	F7 w*	57 W	17 ETB	17 ETB	
15	E	F5 e*	45 E	05 ENQ	05 ENQ	
16	R	F2 r*	52 R	12 DC2	12 DC2	
17	T	F4 t*	54 T	14 DC4	14 DC4	
18	Y	F9 y*	59 Y	19 EM	19 EM	
19	U	F5 u*	55 U	15 NAK	15 NAK	
20	I	E9 i*	49 I	09 HT	09 HT	
21	O	EF o*	4F O	0F SI	0F SI	
22	P	F0 p*	50 P	10 DLE	10 DLE	
23	~ ^	60 ~	5E ^	1E RS	1E RS	
24	+ *	2B +	2A *	2B +	2A *	
25	° §	7B °	40 §	00 NUL	00 NUL	(° = degree; § = section)
26	A	E1 a*	41 A	01 SOH	01 SOH	
27	S	F3 s*	53 S	13 DC3	13 DC3	
28	D	E4 d*	44 D	04 EOT	04 EOT	
29	F	E6 f*	46 F	06 ACK	06 ACK	
30	G	E7 g*	47 G	07 BEL	07 BEL	
31	H	E8 h*	48 H	08 BS	08 BS	
32	J	EA j*	4A J	0A LF	0A LF	
33	K	EB k*	4B K	0B VT	0B VT	
34	L	EC l*	4C L	0C FF	0C FF	
35	ñ Ñ	FC ñ*	5C Ñ	1C FS	1C FS	(ñ = n tilde; Ñ = N tilde)
36	ç ¿	7D ç	5D ¿	1D GS	1D GS	(ç = c cedilla ; ¿ = inverted ?)
37	Z	FA z*	5A Z	1A SUB	1A SUB	
38	X	F8 x*	58 X	18 CAN	18 CAN	
39	C	E3 c*	43 C	03 ETX	03 ETX	
40	V	F6 v*	56 V	16 SYN	16 SYN	
41	B	E2 b*	42 B	02 STX	02 STX	
42	N	EE n*	4E N	0E SO	0E SO	
43	M	ED m*	4D M	0D CR	0D CR	
44	, ;	2C ,	3B ;	2C ,	3B ;	
45	. :	2E .	3A :	2E .	3A :	
46	- _	2D -	5F _	1F US	1F US	

Keyboard Layout Table: Swedish

Key	Label	Normal	SHIFT	CONTROL	Both
0	1 !	31 l	21 !	31 l	21 !
1	2 "	32 2	22 "	32 2	22 "
2	3 #	33 3	23 #	33 3	23 #
3	4 \$	34 4	24 \$	34 4	24 \$
4	5 %	35 5	25 %	35 5	25 %
5	6 &	36 6	26 &	36 6	26 &
6	7 /	37 7	2F /	37 7	26 /
7	8 (	38 8	28 (	38 8	28 (
8	9)	39 9	29)	39 9	29)
9	0 =	30 0	3D =	30 0	3D =
10	+ ?	2B +	3F ?	2B +	3F ?
11	' ~	27 ' 60 ~			
12	< >	3C < 3E >		7F DEL	7F DEL
13	Q	F1 q*	51 Q	11 DC1	11 DC1
14	W	F7 w*	57 W	17 ETB	17 ETB
15	E	E5 e*	45 E	05 ENQ	05 ENQ
16	R	F2 r*	52 R	12 DC2	12 DC2
17	T	F4 t*	54 T	14 DC4	14 DC4
18	Y	F9 y*	59 Y	19 EM	19 EM
19	U	F5 u*	55 U	15 NAK	15 NAK
20	I	E9 i*	49 I	09 HT	09 HT
21	O	EF o*	4F O	0F SI	0F SI
22	P	F0 p*	50 P	10 DLE	10 DLE
23	Å	FD å*	5D Å	1D GS	1D GS (A circle: å = LC; Å = UC)
24	~	7E ~	5E ~	1E RS	1E RS (~ = Overbar)
25	@ *	40 @ 2A *		00 NUL	00 NUL
26	A	E1 a*	41 A	01 SOH	01 SOH
27	S	F3 s*	53 S	13 DC3	13 DC3
28	D	E4 d*	44 D	04 EOT	04 EOT
29	F	E6 f*	46 F	06 ACK	06 ACK
30	G	E7 g*	47 G	07 BEL	07 BEL
31	H	E8 h*	48 H	08 BS	08 BS
32	J	EA j*	4A J	0A LF	0A LF
33	K	EB k*	4B K	0B VT	0B VT
34	L	EC l*	4C L	0C FF	0C FF
35	Ö	FC ö*	5C Ö	1C FS	1C FS (O umlaut: ö = LC; Ö = UC)
36	Ä	FB ä*	5B Ä	1B ESC	1B ESC (A umlaut: ä = LC; Ä = UC)
37	Z	FA z*	5A Z	1A SUB	1A SUB
38	X	F8 x*	58 X	18 CAN	18 CAN
39	C	E3 c*	43 C	03 ETX	03 ETX
40	V	F6 v*	56 V	16 SYN	16 SYN
41	B	E2 b*	42 B	02 STX	02 STX
42	N	EE n*	4E N	0E SO	0E SO
43	M	ED m*	4D M	0D CR	0D CR
44	, ;	2C , 3B ;			
45	. :	2E . 3A :			
46	- _	2D - 5F -		1F US	1F US

Modifier Keys

Modifier keys change the effect of the standard keys.

Key	Modifies
SHIFT	Standard keys, by keyboard layout table
CONTROL	Standard keys, by keyboard layout table
⌘	Special and standard keys (sets high bit)
⌘	Special and standard keys (auto-repeat)
ALPHA LOCK	Standard keys, alphabetic only (starred keys in keyboard layouts)

Special Keys

Special keys always produce the same key codes. They are unaffected by the SHIFT and CONTROL keys, and are not included in the keyboard layout. The special keys on the numeric keypad produce the same ASCII codes as standard keys on the main keyboard, but can be distinguished from them by software.

Special Keys on Main Keyboard

Label	Code	Name
ESCAPE	1B	ESC
TAB	09	HT
RETURN	0D	CR
SPACE	20	SP
←	08	BS
→	15	NAK
↑	0B	VT
↓	0A	LF
– (minus)	2D	–
DELETE	7F	DEL

Special Keys on Numeric Keypad

Label	Code	Name
1	31	1
2	32	2
3	33	3
4	34	4
5	35	5
6	36	6
7	37	7
8	38	8
9	39	9
0	30	0
.	2E	.
ENTER	0D	CR

The ASCII Character Set

\$00	0	NUL	\$20	32	space	\$40	64	@	\$60	96	
\$01	1	SOH	\$21	33	!	\$41	65	A	\$61	97	a
\$02	2	STX	\$22	34	"	\$42	66	B	\$62	98	b
\$03	3	ETX	\$23	35	#	\$43	67	C	\$63	99	c
\$04	4	EOT	\$24	36	\$	\$44	68	D	\$64	100	d
\$05	5	ENQ	\$25	37	%	\$45	69	E	\$65	101	e
\$06	6	ACK	\$26	38	&	\$46	70	F	\$66	102	f
\$07	7	BEL	\$27	39	'	\$47	71	G	\$67	103	g
\$08	8	BS	\$28	40	(	\$48	72	H	\$68	104	h
\$09	9	HT	\$29	41	)	\$49	73	I	\$69	105	i
\$0A	10	LF	\$2A	42	*	\$4A	74	J	\$6A	106	j
\$0B	11	VT	\$2B	43	+	\$4B	75	K	\$6B	107	k
\$0C	12	FF	\$2C	44	,	\$4C	76	L	\$6C	108	l
\$0D	13	CR	\$2D	45	-	\$4D	77	M	\$6D	109	m
\$0E	14	SO	\$2E	46	.	\$4E	78	N	\$6E	110	n
\$0F	15	SI	\$2F	47	/	\$4F	79	O	\$6F	111	o
\$10	16	DLE	\$30	48	0	\$50	80	P	\$70	112	p
\$11	17	DC1	\$31	49	1	\$51	81	Q	\$71	113	q
\$12	18	DC2	\$32	50	2	\$52	82	R	\$72	114	r
\$13	19	DC3	\$33	51	3	\$53	83	S	\$73	115	s
\$14	20	DC4	\$34	52	4	\$54	84	T	\$74	116	t
\$15	21	NAK	\$35	53	5	\$55	85	U	\$75	117	u
\$16	22	SYN	\$36	54	6	\$56	86	V	\$76	118	v
\$17	23	ETB	\$37	55	7	\$57	87	W	\$77	119	w
\$18	24	CAN	\$38	56	8	\$58	88	X	\$78	120	x
\$19	25	EM	\$39	57	9	\$59	89	Y	\$79	121	y
\$1A	26	SUB	\$3A	58	:	\$5A	90	Z	\$7A	122	z
\$1B	27	ESC	\$3B	59	;	\$5B	91	[	\$7B	123	{
\$1C	28	FS	\$3C	60	<	\$5C	92	\	\$7C	124	,
\$1D	29	GS	\$3D	61	=	\$5D	93	]	\$7D	125	}
\$1E	30	RS	\$3E	62	>	\$5E	94	^	\$7E	126	~
\$1F	31	US	\$3F	63	?	\$5F	95	_	\$7F	127	DEL

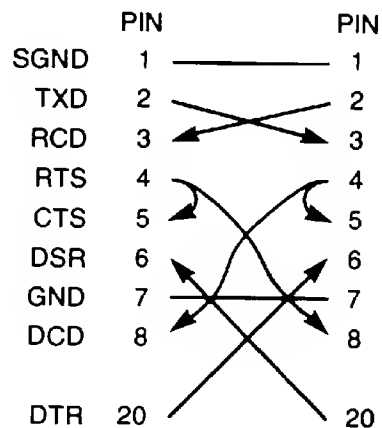
Printer Quick Reference

Appendix C

Add this section to the bottom of page 156:

Modem Eliminator Diagram

The Apple Modem Eliminator is a short cable with a DB-25 connector at each end. The pins are connected as shown.





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